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1. Document ID: US 20030022303 A1

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L4: Entry 1 of 4

File: PGPB

Jan 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030022303

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030022303 A1

TITLE: Vector encoding human globin gene and use thereof in treatment of hemoglobinopathies

PUBLICATION-DATE: January 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sadelain, Michel	New York	NY	US	
Rivella, Stefano	New York	NY	US	
May, Chad	New York	NY	US	
Bertino, Joseph	New York	NY	US	

US-CL-CURRENT: 435/69.1; 435/191, 435/235.1, 435/320.1, 435/325, 435/456, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KOMC	Draw. De
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2. Document ID: US 6642043 B1

L4: Entry 2 of 4

File: USPT

Nov 4, 2003

US-PAT-NO: 6642043

DOCUMENT-IDENTIFIER: US 6642043 B1

TITLE: Double mutants of dihydrofolate reductase and methods of using same

DATE-ISSUED: November 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bertino; Joseph R.	New York	NY		
Ercikan-Abali; Emine A.	New York	NY		
Banerjee; Debabrata	New York	NY		
Mineishi; Shin	New York	NY		

Terms	Documents
human dihydrofolate reductase.clm.	4

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L4: Entry 2 of 4

File: USPT

Nov 4, 2003

US-PAT-NO: 6642043

DOCUMENT-IDENTIFIER: US 6642043 B1

TITLE: Double mutants of dihydrofolate reductase and methods of using same

DATE-ISSUED: November 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bertino; Joseph R.	New York	NY		
Ercikan-Abali; Emine A.	New York	NY		
Banerjee; Debabrata	New York	NY		
Mineishi; Shin	New York	NY		
Sadelain; Michel	New York	NY		

US-CL-CURRENT: 435/252.3; 435/189, 435/193, 435/320.1, 530/350, 536/23.2

CLAIMS:

What is claimed is:

1. A mutant form of human dihydrofolate reductase having activity as a dihydrofolate reductase, said mutant form differing from wild-type human DHFR as defined by Seq. ID No. 7 as a result of a set of mutations comprising a first mutation wherein an uncharged amino acid with a larger volume side chain than leucine is introduced at the amino acid corresponding to amino acid 22 in the wild-type sequence and a second mutation wherein an amino acid which has a smaller volume, more hydrophilic side chain than phenylalanine is introduced at the amino acid corresponding to amino acid 31 in the wild type sequence.
2. The mutant form of human dihydrofolate reductase of claim 1, wherein the first mutation introduces a phenylalanine or tyrosine and the second mutation introduces an alanine, serine or glycine.
3. The mutant form of human dihydrofolate reductase of claim 1, wherein the first mutation introduces a phenylalanine and the second mutation introduces a serine.
4. cDNA encoding a mutant form of human dihydrofolate reductase having activity as a dihydrofolate reductase, said mutant form differing from wild-type human DHFR as defined by Seq. ID No. 7 as a result of a set of mutations comprising a first mutation wherein an uncharged amino acid with a larger volume side chain than leucine is introduced at the amino acid corresponding to amino acid 22 in the wild-type sequence and a second mutation wherein an amino acid which has a smaller volume, more hydrophilic side chain than phenylalanine is introduced at the amino acid corresponding to amino acid 31 in the wild type sequence.

5. The cDNA of claim 4, wherein the first mutation introduces a phenylalanine or tyrosine and the second mutation introduces an alanine, serine or glycine.
6. The cDNA of claim 4, wherein the first mutation introduces a phenylalanine and the second mutation introduces a serine.
7. A DNA vector comprising DNA encoding a mutant form of human dihydrofolate reductase having activity as a dihydrofolate reductase, said mutant form differing from wild-type human DHFR as defined by Seq. ID No. 7 as a result of a set of mutations comprising a first mutation wherein an uncharged amino acid with a larger volume side chain than leucine is introduced at the amino acid corresponding to amino acid 22 in the wild-type sequence and a second mutation wherein an amino acid which has a smaller volume, more hydrophilic side chain than phenylalanine is introduced at the amino acid corresponding to amino acid 31 in the wild type sequence.
8. A mammalian cell which produces a mutant form of human dihydrofolate reductase having activity as a dihydrofolate reductase, said mutant form differing from wild-type human DHFR as defined by Seq. ID No. 7 as a result of a set of mutations comprising a first mutation wherein an uncharged amino acid with a larger volume side chain than leucine is introduced at the amino acid corresponding to amino acid 22 in the wild-type sequence and a second mutation wherein an amino acid which has a smaller volume, more hydrophilic side chain than phenylalanine is introduced at the amino acid corresponding to amino acid 31 in the wild type sequence.
9. The mammalian cell of claim 8, wherein the cell is a hematopoietic cell.
10. The mammalian cell of claim 9, wherein the cell is a peripheral blood cell.
11. The mammalian cell of claim 8, wherein the first mutation introduces a phenylalanine or tyrosine and the second mutation introduces an alanine, serine or glycine.
12. The mammalian cell of claim 8, wherein the first mutation introduces a phenylalanine and the second mutation introduces a serine.

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WEST Search History

DATE: Monday, December 06, 2004

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<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>			
<input type="checkbox"/>	L6	human with dihydrofolate reductase and dna	622
<input type="checkbox"/>	L5	human with dihydrofolate reductase	663
<input type="checkbox"/>	L4	human dihydrofolate reductase.clm.	4
<input type="checkbox"/>	L3	human dihydrofolate reductase	131
<input type="checkbox"/>	L2	human dihydrofolate reductase	0
<input type="checkbox"/>	L1	human difoliate reductase	0

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